sisted of several shocks separated by short intervals. These shocks were noticed at Basel, Brugg, Solothurn, on the Swiss side of the Rhine, and at Lörrach, Schopfheim, Waldshut, &c., on the Badish bank. They recurred at Basel on January 17, and on March 29 they were again felt in the whole area described, and then even at Freiburg and Strasburg.

Other instances of repeated earthquakes are :—

Innsbruck (January 3, 10, 11, February 2, August 9).

Gross Gerau (January 2, March 25).

Lisbon (January 26, 27, June 8).

Piemont (repeated shocks on November 25).

Constantinople, Ismid, and Brussa (continual shocks from 19 to end of May).

The damage done by the last-mentioned phenomenon at Ismid and Brussa on April 19 was very considerable; the little town of Esmé was quite destroyed, and many inhabitants lost their lives. The English fleet, which happened to be anchored in the Bosphorus at the time, noticed the oscillations, and on board of one of the ships it was believed that the others were making torpedo experiments, and consequently looked out for shelter.

Less remarkable by its violence than by its enormous extent considering its intensity, was the Low-Rhenish earthquake of August 26. The observations in this case were unusually exact and numerous, which gives additional interest to the occurrence. It began about 9 A.M., and was best observed in the city of Cologne. Here it consisted of an undulatory rising and sinking of the ground, which increased in intensity to such an extent that some buildings began to oscillate ominously. On the cathedral tower the smaller bell struck several times and the wavering pillars in St. Gereon's Church caused such a panic among the congregation, that all rushed out. In many parts of the city the walls of houses showed cracks. At the end of the oscillations a dull subterranean noise was heard and a second shock was observed by many persons. In almost all localities in the Rhenish Province, from Cleve and Emmerich to Kyllburg, Ottweiler, and Montjoie the observations of the phenomenon were similar to those made at Cologne; the same was the case on the opposite bank of the Rhine, at Düsseldorf, Wiesbaden, Münster, and other places. At Aachen (Aix-la-Chapelle) five distinct shocks were noticed; at Elsdorf (on the Neuss-Düren Railway) no less than eighteen until the morning of August 27; and at Düren and Buir their number was but little below this figure.

The area struck by the first shock, on August 26 at 9 A.M., may have measured over 2,000 geographical square miles, as its outlines may be indicated as follows :—Arnsberg and Hanover in the north, Offenbach on the Main and Michelstadt in the Odenwald in the south-east, Strasburg, Paris, and Charelville in the south, Liége and Brussels in the west, and Utrecht in the north-west.

Prof. Klinkerfues has collected the most reliable observations of time and reduced them to the meridian of Paris. According to these calculations the earthquake happened at Cologne at 8h. 38·7m., at Strasburg at 8h. 39·9m., at Göttingen at 8h. 40·9m., at Hanover at 8h. 42·4m., and at Paris at 8h. 45·0m. If the starting point of the oscillations according to number and intensity of the shocks be supposed to have been situated about 2·5 geographical miles to the west of Cologne, the above indications of time give a velocity of the earthquake in the ground of 6·78 geographical miles, with a probable error of ± 0·48 miles. The depth of the original starting-point is unknown. Prof. Klinkerfues is of opinion that it laid between 6·3 and 8·7 geographical miles from the surface. It is remarkable that the phenomenon was only noticed at the surface, and was all the more intense the higher the observer was above the ground. Many observations were made both at Cologne and at Hanover, which show that the oscillations were far more considerable in the upper storeys of houses than in the lower ones. At Remagen the shock was so great on the upper floor of the school-building that teachers and school-children rushed terrified into the street, while on the ground floor the phenomenon was hardly noticed; the workmen on the towers of Cologne Cathedral saw the scaffolding oscillate to such an extent that they feared for their lives, and a water-tank on the vault of the choir was almost entirely emptied. Yet not one of 1,100 miners working at a depth of 300 metres at Altessen noticed the least shock.

For a long time afterwards shocks occurred at Elsdorf and Buir. At the latter place they were observed on August 26, 27, 28, 29, September 2, October 24, December 3 and 10. Also in other places of the same area the shocks were repeated, so at Remagen (September 3), Wiesbaden (September 14), Osterrath and Crefeld (September 18), Cologne (December 10), Luxemburg and Namur (December 15).

With almost all earthquakes of slight intensity it is very difficult to determine to what class of earthquakes they belong. Thus in the Low-Rhenish earthquake no symptom points to any particular cause. We may surmise volcanic influence, because the most intense and most numerous shocks occurred near the north-western slope of the Eifel-plateau; but with perhaps greater reason we may look for the cause of the phenomenon in the Rheno-Belgian coal district. Altogether the earthquake of August 26 seems to be but a link in a great earthquake-period, which for some years past has been causing lasting changes in the coal-deposits of that neighbourhood. The names of Herzogenrath, Kohlscheid, Eschweiler, &c., recur in every one of Dr. Fuchs's yearly accounts, and apart from numerous weaker oscillations of small extent, considerable earthquakes occurred in this district from September 28 to November 12, 1873, and on June 24, 1877.

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE

IT is stated that the draft charter of the proposed Victoria University has, in accordance with the request of the Lords of the Privy Council, been submitted to that body. According to this draft, the University would have the power of conferring upon all persons, whether male or female, who have pursued a regular course of study in any of its colleges and passed its examinations, all degrees which can be conferred by any other University of the kingdom, with the exception of medical degrees, the Privy Council having declined to confer power as to these at a time when legislation on the whole subject of medical degrees and the licensing power for the practice of medicine has been proposed to Parliament and still remains unsettled. The charter, it is stated, contains provisions for establishing a convocation of graduates of the University, with appropriate rights and functions.

IN the late Higher Local Examinations of Cambridge University, Physiology and Experimental Physics were introduced as separate subjects in Group E for the first time. One student, Miss A. Johnson, of Cambridge, passed in Physics, and out of sixteen who entered their names in Physiology, in which subject Mr. J. N. Langley, Fellow of Trinity College, was examiner, eleven passed, but no candidate obtained the mark of distinction. Only three passed in Zoology out of eighteen candidates; but two were distinguished; the failures were about three-fifths of the thirty-four candidates in Botany, and three obtained distinction. Twenty-two passed in Geology and Physical Geography, five obtaining the mark of distinction. In the first class of Group E four students are placed: Miss C. E. Cross, educated at 56, Regent Street, Cambridge, is distinguished in Botany and Geology, and passes in Chemistry; Miss L. M. Passavant, of De la Haye House, Leeds, is distinguished in Botany and Zoology; the candidate numbered 294, Leeds, name not published, is distinguished in Geology and Zoology, and has passed in Physiology; Miss M. A. Broadhurst, Liverpool College for Girls, is distinguished in Geology and Chemistry. Six passed Second Class in Group E, and twenty-eight were placed in the Third Class, to attain which passing in one subject is required, no more than three to be taken in any one year; others may be taken in subsequent years. In Group C (Mathematics) only two obtained distinction, namely, A. G. Lee, Dedham, Essex, and C. E. Oldaker, Chesterton Road, Cambridge, and eight obtained a First Class. The award of Scholarships dependent on the results of this examination has not yet been known.

ABOUT three years ago publicity was given to a proposal by Mr. Holloway, of Oxford Street, to expend a considerable amount of money in the erection of a college for the higher education of women. Since that time Mr. Holloway has purchased about ninety-five acres of land at Egham, near Virginia Water, known as the Mount Lee Estate, and has vested the same in trustees. Before deciding upon the form of the building, Mr. Holloway and his architect, Mr. W. H. Crossland, visited the principal collegiate institutions in Europe, and during the past year the plans and specifications have been completed. We now learn that a contract has been actually signed by Mr. Holloway for the building of the college within four years, the contract price being upwards of 250,000*l.*, exclusive of fittings

and furniture. The building will be in the form of a double quadrangle, 510 feet from east to west, and 350 feet from north to south. The main buildings will be five storeys in height, and there will be cloisters 10 feet in width on two sides of each quadrangle. The style is to be that known as French Renaissance, and will be carried out in Portland stone and red brick. The object and scope of the college have been the subject of great consideration, and Mr. Holloway has had the advice and assistance of a large number of persons interested in the education of women. The proposed constitution of the college, to be embodied in a trust-deed, will, among other things, set forth that its object is to afford the best education suitable for women of the middle and upper middle classes, and it is intended to be mainly self-supporting. The trustees are to be a corporate body with perpetual succession, and to have all the usual powers and privileges. The governing body will consist of twenty-one persons, to be appointed partly by the University of London and partly by the Corporation of London, and it is stipulated that a certain portion shall always be women. Religious opinions are not in any way to affect the qualification for a governor. It is the founder's desire that power by Act of Parliament, Royal Charter, or otherwise, should be eventually sought to enable the college to confer degrees, after due examination, and that until such power is obtained the students shall qualify themselves to pass the women's examination of the London University, or any examination of a similar or higher character which may be open to women at any of the existing universities of the United Kingdom. The curriculum shall not be restricted to subjects enjoined by any existing university. Instead of being regulated by the traditions and methods of former ages, the system of education should be mainly founded on studies and sciences which the experience of modern times has shown to be most valuable and as best adapted for the intellectual and social requirements of students. The governors will, therefore, be empowered to provide instruction in any subject or branch of knowledge which shall appear to them from time to time most suitable for the education of women; and the curriculum of the college will not discourage students who may desire a liberal education apart from the Latin and Greek languages. Proficiency in classics is not to entitle students to rewards of merit over others equally proficient in other branches of knowledge. It is intended to provide twenty founder's scholarships of the value of 40*l.* each, tenable for not more than two years in the college. No professor will be required to submit to any test concerning his or her religious opinion, and denominational theology is not to be taught. The principal of the college must be a lady, and duly qualified lady physicians and surgeons are to be resident in the college. Mr. Holloway has determined to personally superintend the erection of the building, and has agreed to provide an endowment fund of 100,000*l.*, in addition to any fund that may be derived from the sale of such portion of the Mount Lee estate as may not be required for the purposes of the college.

THE following is the list of candidates successful in the competition for the Whitworth Scholarships, 1879, in connection with the Science and Art Department:—John Hardisty, engineer; George Harrison, millwright; Edward Shaw, engineer apprentice; John A. Simpson, engineer; John W. Geddes, mechanic; Sydney J. Harris, engine fitter; Thomas E. Sackfield, mechanic; John A. Brodie, engineer apprentice. As the result of the final competition of scholars appointed in 1876, Mr. Henry S. H. Shaw has received the first prize of 200*l.*, and Mr. Jerdan Nichols the second of 100*l.*

THE first Siberian university at Tomsk will be definitely opened for the term of 1879-80. The Czarewitch has signified his intention of being present at the inauguration.

FROM a report which has been sent us of the awards made at the conclusion of the session of the Johns Hopkins University, we notice that out of twenty Fellows appointed for 1879-80, twelve were in physical and biological science, all of them from other colleges than the Johns Hopkins, one of them being from the University of Tokio, Japan. The public spirit of the president and professors is shown in the fact that they have subscribed 500 dollars to be divided as scholarships to two meritorious students next year. In consideration of marked ability in the study of mathematics exemplified during a year's residence in Baltimore and previously, the trustees have invited Miss Christine Ladd to continue her mathematical studies in this university, and have voted that she may receive an honorary stipend, equal to that bestowed upon those who are appointed to fellowships. The trustees promised their aid to a specified amount for the encouragement of a journal of philology, to be published under the editorial control of Prof. Gildersleeve. This will be the fourth serial encouraged by the trustees—the others being the *Journal of Mathematics*, under Prof. Sylvester; the *Journal of Chemistry*, under Prof. Remsen; the *Biological Papers*, under Prof. Martin. The *Chesapeake Zoological Papers*, edited by Dr. Brooks, were published at the cost of a few liberal citizens of Baltimore. Arrangements have been matured for the continuance of the Chesapeake Zoological Laboratory during the ensuing year. The United States Fish Commission, under Prof. S. F. Baird, and the Maryland Fish Commission, under Major T. B. Ferguson, co-operate in this laboratory with the Johns Hopkins University.

## SOCIETIES AND ACADEMIES

PARIS

**Academy of Sciences,** August 4.—M. Daubrée in the chair.—The following papers were read:—On the recent tornado in the United States, and on records of Buffon's and Spallanzani's observations of whirlwinds, by M. Faye.—Remarks by M. Berthelot on M. Wurtz's paper on hydrate of chloral.—Secreting and circulating effects produced by the faradisation of the nerves which traverse the tympanum, by M. A. Vulpian.—Supplementary note on the theory of the pulsations of the heart and arteries and their registration, by M. Bouillaud.—On the origin of hail, and on some whirlwinds in which the air was drawn upwards, by M. Colladon.—On the theory of fertilisation, by M. Dechant.—Note on the rotation theory of heavenly bodies, by M. Mougeolle.—A number of communications relating to *Phylloxera vastatrix*, by MM. Gayon and Millardet, G. Foex, A. Quercy, Borel, and H. Barthélemy, were read.—Observations of the occultation of Antares on July 28 last, by C. Flammarion.—On the normal calorific spectrum of the sun, and of the incandescent platinum lamp (Bourbouze), by M. Mouton.—Some observations on M. Mouton's paper, by M. P. Thenard.—On the vibrations on the surface of liquids, by M. F. Lechat.—On Ampère's currents by M. Trève.—On magnets, by the same.—On the distillation of liquids under the influence of static electricity, by M. D. Gernez.—On the employment of the diffusion method in the study of the phenomena of dissociation, by M. L. Troost.—On the action of pyrogallate of potassium upon nitric oxide, by M. G. Lechartier.—On solid hydrocyanic acid, by MM. Lescœur and A. Rigaut.—On synthetic methylpropylcarbinol, by J. A. Le Bel.—On the non-existence of a soluble alcoholic ferment, by M. D. Cochin.—On the colouring matter of *Palmella cruenta*, by Mr. T. L. Phipson.—On the vital properties of cells and on the appearance of their nuclei after their death, by M. L. Ranvier.—On the lymphatics of the perichondrium, by Messrs. G. and Fr. E. Hoggan.—Note by M. L. Hugo, on a number representing the sphere among the ancients.

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